**ESS Topic 3: Human Population, Carrying Capacity and Resource Use**

Population Dynamics

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| **Learning Outcomes** | **Main Ideas** | **Specific content that you would use to answer this question** | **Relevant Case Studies & Description** |
| Describe the nature and explain the implications of exponential growth in human populations |  |  |  |
| Calculate and explain, from given data, the values of crude birth rate, crude death rate, fertility, doubling time and natural increase rates |  |  |  |
| Analyze age/sex pyramids and diagrams showing demographic transition models |  |  |  |
| Discuss the use of models in predicting the growth of human populations |  |  |  |

Limits to Growth

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| **Learning Outcomes** | **Main Ideas** | **Specific content that you would use to answer this question** | **Relevant Case Studies & Description** |
| Explain the difficulties in applying the concept of carrying capacity to local human populations |  |  |  |
| Explain how absolute reductions in energy and material use, reuse and recycling can affect human carrying capacity |  |  |  |

Environmental Demands of Human Populations

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| **Learning Outcomes** | **Main Ideas** | **Specific content that you would use to answer this question** | **Relevant Case Studies & Description** |
| Explain the concept of an ecological footprint as a model for assessing the demands that human populations make on their environment. |  |  |  |
| Calculate from appropriate data the ecological footprint of a given population, stating the approximations and assumptions involved |  |  |  |
| Describe and explain the differences between the ecological footprints of two human populations, one from an LEDC and one from an MEDC |  |  |  |
| Discuss how national and international development policies and cultural influences can affect human population dynamics and growth |  |  |  |
| Describe and explain the relationship between population, resources consumption and technological development, and their influence on carrying capacity and material economic growth |  |  |  |

Resources-Natural Capital

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| **Learning Outcomes** | **Main Ideas** | **Specific content that you would use to answer this question** | **Relevant Case Studies & Description** |
| Explain the concept of resources in terms of natural income |  |  |  |
| Define the terms renewable, replenishable and non-renewable natural capitol |  |  |  |
| Explain the nature of the concept of a resource |  |  |  |
| Discuss the view that the environment can have its own intrinsic value |  |  |  |
| Explain the concept of sustainability in terms of natural capital and natural income. |  |  |  |

**\*You will not be assessed on 3.2.6 and 3.2.7**

The Soil System

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| **Learning Outcomes** | **Main Ideas** | **Specific content that you would use to answer this question** | **Relevant Case Studies & Description** |
| Outline how soil systems integrate aspects of living systems |  |  |  |
| Compare and contrast the structure and properties of sand, clay, and loam soils, including their effect on primary productivity |  |  |  |
| Outline the processes and consequences of soil degradation |  |  |  |
| Outline soil conservation measures |  |  |  |
| Evaluate soil management strategies in a named commercial farming system and in a named subsistence farming system |  |  |  |

Food Resources

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| **Learning Outcomes** | **Main Ideas** | **Specific content that you would use to answer this question** | **Relevant Case Studies & Description** |
| Outline the issues involved in the imbalance in global food supply |  |  |  |
| Compare and contrast the efficiency of terrestrial and aquatic food production systems |  |  |  |
| Compare and constrast the inputs and outputs of materials and energy (energy efficiency), the system characteristics, and evaluate the relative environmental impacts for two named food production systems |  |  |  |
| Discuss the links that exist between social systems and food production systems |  |  |  |

Water Resources

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| **Learning Outcomes** | **Main Ideas** | **Specific content that you would use to answer this question** | **Relevant Case Studies & Description** |
| Describe the Earth’s water budget |  |  |  |
| Describe and evaluate the sustainability of freshwater resource usage with reference to a case study |  |  |  |

\*You will not be assessed on 3.3 (Energy)